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SPATHIPORA MAZATLANICA, A NEW SPECIES OF BURROWING BRYOZOA (CTENOSTOMATA) FROM MAZATLÁN, SINALOA, MÉXICO

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ABSTRACT: A new species of burrowing Bryozoa (Ctenostomata) from México, *Spathipora mazatlanica*, is described and illustrated. The polypide anatomy of the genus *Spathipora* is determined for the first time.

Although the genus *Spathipora* was erected by Fischer in 1866 from material collected off the French Mediterranean coast, confirmation of its bryozoan ctenostomatous affinities, in general, was not made until the work of E. Marcus appeared in 1938. The specimens of *Spathipora* available to Marcus from Baía de Santos, Brazil had evidently suffered considerable cytolysis, since he was only able to show the cuticle, with the general morphology of the autozoid, and the attachment of the stolon close to the proximal (caudal) extremity of the zoid. Marcus also described the anatomical features of *Terebripora ramosa* d'Orbigny collected from the same locality, and established that the point of attachment of the stolon to the zoid was about midway between the apertural (distal) and caudal (proximal) extremities, more often closer to the apertural rather than the caudal end. Subsequent work by Soule (1950, 1963), Soule and Soule (1968, 1969a, 1969b), and Voigt and Soule (1973) has confirmed the *Terebripora* structural plan. Silén

(1946, 1947) erected two new genera of burrowing bryozoans, *Immergentia* and *Penetrantia*, and described their anatomy.

In material collected at Mazatlán, México in 1973 we have found well preserved zoaria of *Spathipora*. The anatomical details of *Spathipora* are available for the first time from whole mounts and serial sections, and comparisons can be made with those burrowing bryozoans whose structure is well known.

FAMILY TEREBRIPORIDAE D'ORBIGNY 1847

Genus *Spathipora* Fischer 1866

Spathiporu mazatlanica, new species

Holotype.—Allan Hancock Foundation bryozoan number 180. Allan Hancock Foundation, University of Southern California, Los Angeles, California.

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Figure 1. Photomicrograph of the tracings of *Spathipora mazatlanica*, new species, on the mollusc shell surface. Photographed $\times 50$. Figure 2. Scanning electron microscope photomicrograph of an epon cast of a zoid of *Spathipora*. Photographed $\times 200$.

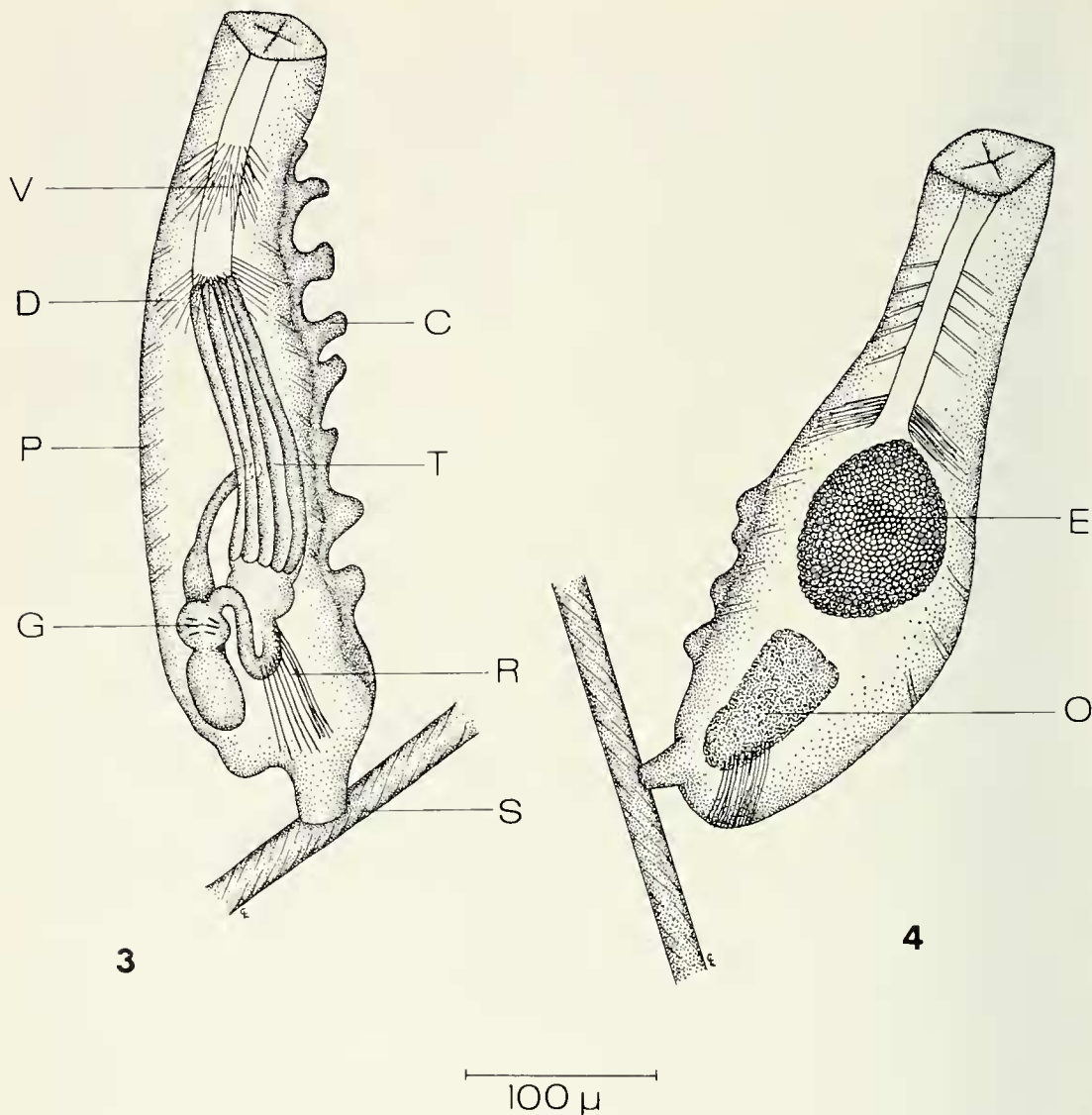


Figure 3. Drawing of a zooid of *Spathipora* showing proximal attachment, communication tubules and internal anatomy. Figure 4. Drawing of a reproductive zooid with embryo and degenerate polypide. C, communication tubules; D, diaphragm muscle; E, embryo; G, gizzard; O, degenerate polypide; P, parietal muscle; R, retractor muscle; S, stolon; T, tentacles; V, vestibular muscle.

Etymology.—The name is derived from the harbor at Mazatlán, Sinaloa, México, the site of the type locality.

Diagnosis.—Bryozoa, Ctenostomata, with zoaria burrowing in mollusc shells. Surface tracings are pennate, with zooid apertures alternating along both primary and secondary stolons. Apertural openings ovoid to key-hole shaped, narrowing on the side adjacent to the stolon. Zooids are elongate, weakly curved, tapered at the caudal (proximal) extremity,

squared at the apertural region. Zooids attached to stolons near the caudal region. Zooids range in length from 310 μm to 510 μm , in width from 95 to 120 μm . Tentacle number is 8.

Description.—Burrowing stolonate colonies are extensive in shells of the gastropod *Strombus*. They consist of branching primary and secondary stolons, with the zooids attached by short tertiary stolons which originate near the caudal extremities. The colonies are visible on the surface of mollusc shells

as regular, feather-like (pennate) tracings, with apertural openings alternating from one side to the other of the primary and secondary stolons (Fig. 1). Apertural openings are irregularly ovoid to key-hole shaped in morphology, narrowed at the edge facing the stolon. These openings are from 50 to 60 μm in diameter.

Material studied was transferred directly to formol-seawater as it was collected. Even short exposure to air causes cytolysis. Some colonies were decalcified in 5% trichloroacetic acid for use in whole mounts that were stained with azocarmine, and for serial histological sections. Epon casts were made of other colonies based on the techniques of Hillmer (1968) and Pohowsky (1974) for examination by scanning electron microscopy. Zoids are moderate in size, cylindrical, slightly curved and tapering to a single, or occasionally double, knob-like proximal termination. In position, the zoids lie almost parallel to and immediately beneath the outer surface of the mollusc shell (Fig. 2). The primary and secondary stolons often have short blind extensions which reach the free surface of the mollusc shell, giving the stolons an undulating pattern.

The zoids of *Spathipora* also possess short lateral accessory tubules that extend to the surface of the mollusc shell (Fig. 3). They are found in a linear series along the abanal wall of the zoid, and range in number from a single communication tubule to as many as eight on a zoid. The stained whole mounts and serial sections show these communication tubules to be hollow, highly cellular in their basal regions, and capped by a keratinized cuticle. Their function is uncertain; possibly respiratory or excretory exchange occurs there between the zoid and the sea water.

Anatomically, the polypide consists of eight tentacles and a digestive tract of which the most distinctive feature is a prominent gizzard with chitinized denticles. The musculature consists of a set of retractor muscles located proximally, parietal muscles positioned laterally, and two pairs each of diaphragm muscles and vestibular muscles in the apertural region. The whole mounts and sections also reveal the presence of zoids with brown bodies.

Reproductive zoids (Fig. 4) were relatively rare and scattered at random throughout the colonies. The reproductive zoids ranged from 375 to 450 μm in length and 100 to 115 μm in width. Each possesses a prominent ovoid egg or embryo distally; a degenerate polypide lies proximally.

Measurements.—The smallest functional zoid was 310 μm long and 95 μm wide, the largest was 510 μm long and 120 μm wide. The length range encountered most frequently was 440 to 480 μm . The diameter of the primary and secondary stolons is 20 μm .

Type locality.—USC-Sea Grant field trip SCUBA station, off Isla Lobos, in the harbor at Mazatlán, Sinaloa, México (23°13.5'N., 106°29'W.); depth 8

meters; 28 June 1973; in eroded shells of *Strombus* (sp?); collectors, P. Pinter, J. McSweeney, P. Widdell, and M. Hooper.

Affinities.—*Spathipora* in the generic sense has many structural components that are similar to those in *Terebripora*, notably the prominent gizzard, the tapering zoid morphology and the general pattern of zoarial tracing on the molluscan shell. The tracings on the mollusc shells by *Spathipora* may be more regular and pennate than those of *Terebripora*, but they are much alike in their basic structure. The zoids of *S. mazatlanica* are smaller than those of *S. sertum* Fischer, which are 450–550 μm in length and 120–170 μm in width (Marcus 1938). There are no other anatomical details of *S. sertum* available on which a comparison can be based.

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VARIATION IN THE SOUTH AMERICAN COLUBRID SNAKE
TANTILLA SEMICINCTA (DUMÉRIL, BIBRON, AND DUMÉRIL),
WITH COMMENTS ON PATTERN DIMORPHISM

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ABSTRACT: Variation and distribution of *Tantilla semicincta* are discussed. This species exhibits pattern dimorphism. One phase has a banded dorsal pattern and the other a striped dorsal pattern. Variation in scutellation is described. This species is known to occur along the Caribbean coastal regions of Colombia and Venezuela. Purported occurrence of this snake in Panamá is discounted. Relationships of *T. semicincta* with other banded species of *Tantilla* are discussed and a key to those species is provided.

Little information is available concerning the species of *Tantilla* occurring in South America. This paper is the first in a series dealing with the taxonomy and distribution of the species of *Tantilla* known from that continent.

Tantilla semicincta (Duméril, Bibron, and Duméril) is one of the few species in the genus with a banded dorsal pattern. Only three other species, *T. annulata*, *T. shawi*, and *T. supracincta*, have such a pattern. *Scolecophis atrocinctus*, an apparent close relative of *Tantilla* (Stickel, 1943), has a pattern very similar to that of *T. semicincta*.

Tantilla semicincta is also the only species in the genus known to exhibit a pronounced pattern dimorphism. *Tantilla melanocephala* has been reported to exhibit pattern dimorphism (Roze, 1966), some individuals having a dark middorsal stripe, whereas others lack it, but it has been suggested that *T. melanocephala*, as currently conceived, may be a composite taxon (Schmidt and Walker, 1943). This problem is presently under investigation.

PATTERN DIMORPHISM AND
VARIATION IN *TANTILLA*
SEMICINCTA

Boulenger (1896) was the first worker to note the pattern dimorphism in *T. semicincta*, and he did so in passing by placing *Homalocranion lineatum* Fischer in the synonymy of *T. semicincta* and noting the different patterns in his description of the species.

Pattern Dimorphism.—*Tantilla semicincta* exhibits two basic pattern variants, one striped, and the other banded. In addition, some specimens exhibit a pattern intermediate between that of the two phases.

The striped pattern (Fig. 1) is present in two specimens examined (BMNH 86.5.15.16-17) and consists of a pale middorsal stripe occupying the middorsal scale row and adjacent halves of the paravertebral rows, flanked by dark dorsolateral

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